PROJECT NEED FOR THE REHABILITATION

OF THE

ELM STREET BRIDGE

BRIDGE NO. F-09-003 (3KQ)

ELM STREET (ROUTE 79) OVER THE ASSONET RIVER

FREETOWN, MASSACHUSETTS

AUGUST, 2007

TOWN OF FREETOWN
BOARD OF SELECTMEN
Town Hall
3 North Main Street
P.O. Box 438
Assonet, MA 0270-2201
PHONE: 508-644-2201
FAX: 508-644-3324

Mr. Bernard McCourt
District Highway Director
Massachusetts Highway Department
District 5 Office
1000 County Street
Taunton, MA 02780

Reference: **Freetown** – Project Request
Rehabilitation of Bridge No. F-09-003 (3KQ) (Elm Street Bridge), Route 79 over the Assonet River

The Town of Freetown requests that the referenced project be considered by the Massachusetts Highway Department (MassHighway) for acceptance and funding for structural improvements of the Elm Street Bridge; Bridge No. F-09-003 (3KQ), Elm Street (Route 79) over the Assonet River. This letter is intended to provide MassHighway with pertinent information regarding the project for the purpose of establishing eligibility and placement into an appropriate funding category. In the spirit of partnership, the Town respectfully requests MassHighway's participation in working collaboratively to rehabilitate the Elm Street Bridge.

Bridge No. F-09-003 (3KQ) is a critical component of Freetown's downtown transportation infrastructure and an important part of Freetown's economic vitality. Moreover, Route 79 through Freetown is a major link between Route 24 and Route 140 servicing more than 23,000 vehicles each day. The bridge is a three (3) span dry-laid stone masonry arch structure, constructed in 1822. The bridge has been reviewed by the Massachusetts Historical Commission, which determined in 1980 that it is eligible for listing in the National Register of Historical Places. The bridge is also a contributing component to the Assonet Historic District.

The most recent routine arch bridge inspection rated the major components of the structure and concluded that "local failures are possible". The bridge inspection report noted that the level of deterioration is a "Severe/Major Deterioration" and recommended that a repair program be instituted "ASAP". A recently performed load rating for the bridge determined that the controlling load rating is 10.8 tons under H 20 truck loading. MassHighway has concurred and subsequently posted the bridge for six (6) tons.

The current bridge posting has necessitated detouring school busses, emergency rescue, and fire department vehicles, noticeably impacting response times. Clearly the potential impacts to public safety are of serious concern to the Town. Additionally, commercial truck traffic is detoured across Town lines into the Town of Berkley. Traffic is detoured through neighborhoods along narrow, winding roads with no shoulders such as Bryant Street in the Town of Berkley. The detour adversely affects roads in the two Towns.

Goals of the project:

- Re-open the bridge to all vehicles through strengthening of the bridge;
- Improve roadway infrastructure;
- Enhance public safety;
- Improve traffic operations;
- Provide better access to downtown and east/west access through Freetown;
- Improve pedestrian and bicycle facilities/access;
- Improve emergency vehicle access by reopening Route 79 to school busses, police vehicles, and emergency and fire rescue vehicles.

Ultimately the rehabilitation/repair will improve the load rating to above statutory levels, eliminate the posting of the bridge, and address the structural deficiencies outlined in the October 4, 2006 bridge inspection report. All repairs will be made while maintaining the historical integrity of the bridge.

The Town is requesting that MassHighway consider participating in the project with a commitment to construct the improvements once the Town has completed a MassHighway approved design. The Town, at its expense has engaged the services of a MassHighway approved consultant (Jacobs Edwards and Kelcey) to prepare design and construction documents for the rehabilitation/repair of the bridge.

Due to the condition of this structure, and its importance to the daily function of the Town and its residents, time is of the essence in completing the improvements. The Town is especially concerned considering that the design and review process could take several months. The Town of Freetown is committed to providing the support necessary at the executive level to ensure that the State and Federal design requirements are met. In addition, there is overwhelming public support the proposed project.

The proposed improvements to Bridge No. F-09-003 are overdue and are essential to enhance and improve access and safety to and through this critical section of the Freetown. In order to provide these improvements and to meet present and future traffic demands, we again respectfully request that you consider the proposed rehabilitation of Bridge No. F-09-003 (3KQ). To that end we are available to meet with you and your staff to determine the appropriate next steps to advance this project.

The Town anticipates the total construction cost for improvements to the Elm Street Bridge and approach roadway to be approximately Two Million Dollars ($2M). The proposed improvements will include structural strengthening of the existing historic arch, safety improvements with crash-tested bridge railings, new approach guardrail, and a wider sidewalk which may be in the form of a separate structure, as well as traffic, roadway alignment, and

drainage improvements to the approach roadway. We anticipate a nine (9) month period of time to design the rehabilitations to the roadway and bridge.

The Town of Freetown would like to thank MassHighway for its continued support in addressing our transportation infrastructure needs and for considering this request. If we can be of further assistance, or if you require additional information, please contact Erik Stoothoff, PE of Jacobs Edwards and Kelcey at (617) 242-9222. We look forward to working with MassHighway and advancing the rehabilitation of Bridge No. F-09-003 (3KQ).

Sincerely

BOARD OF SELECTMEN

J C Fox

Jean Fox

c. State Senator Menard
State Representative Sullivan
State Representative Quinn
State Representative Canessa

MASSACHUSETTS HIGHWAY DEPARTMENT – DISTRICT 5

PROJECT NEED FORM (PNF)

Massachusetts Highway Department - District 5
Project Need Form (PNF)

This form is intended to provide preliminary information about the proposed project. It is not expected that all information that is asked for is available or known but applicants are encouraged to complete the form as fully as possible.

From: Lawrence Ashley **Title:** Chairman, Board of Selectmen

Municipality/Organization: Town of Freetown

Phone: (508) 644-2201 **Fax:** (508) 644-3342

Date: August 15, 2007 **Email:** selectmen@town.freetown.ma.us

Project Reference No. (to be filled out by MassHighway): _____

PART I - LOCATION IDENTIFICATION AND DESCRIPTION OF NEED

Municipality: Town of Freetown

Route and/or Street(s): Route 79 (Elm Street)

Bridge ID Number (if applicable): F-09-003 (3KQ)

Who owns the roadway/facility? Town

Estimated project limits by mile marker and station from MassHighway's roadway database or other distinguishing landmarks such as cross street(s). Include a locus map of the project and photos illustrating project need:

Start: Elm Street (Begin at Station 10+00 as shown on Plan)

End: Mill Street (End at Station 14+00 as shown on Plan)

Total Mileage: 0.1 miles 400 linear feet

Please provide a brief description of the project need:

Bridge No. F-09-003 (3KQ) is a three span, dry-laid, historic stone masonry arch bridge, built in 1822 that carries Route 79 (Elm Street) over the Assonet River in the village of Freetown, Massachusetts. An October 4, 2006 Inspection Report by MassHighway Bridge Inspection Unit rated the bridge arch ring as structurally deficient. The inspection report noted evidence that several of the stones had fallen since the previous inspection. A December 2006 Bridge rating report found the controlling inventory load rating for the bridge to be 10.8-Tons. MassHighway subsequently posted the bridge for a maximum gross vehicle weight of 6-Tons, recognizing the long-term structural stability of the bridge. Route 79 (Elm Street) is the primary route through Freetown, and the closure of the Elm Street Bridge to vehicles over 6-Tons has resulted in the detouring of emergency response vehicles, school busses, and other commercial traffic. Repairs to this bridge and approach roadway are vital to the safety of the traveling public and the economic vitality of the TOWN.

If the needed repairs are not made to the bridge, the structure will continue to deteriorate until such time that the bridge will be closed to all traffic. The bridge has been classified as eligible for designation as a historic place, and is an integral part of the Assonet Historic District in the village of Freetown.

Estimated Construction Cost: $2,000,000

Does the project have Federal Funding? ☐ **Yes** ☒ **No**

If yes, legislation: _____ Amount:

Is the project authorized in a state transportation bond bill? ☐ **Yes** ☒ **No**

If yes, bill: _____ Amount:

PART II- PROJECT BACKGROUND

In what type of area is the project located? *Project limits may include more than one type of area. For a definition of areas, please refer to Chapter 3 of the Guidebook.*

- ☐ Rural Natural
- ☐ Rural Village
- ☐ Rural Developed
- ☐ Suburban Low Density
- ☐ Suburban High Density
- ☒ Suburban Village/Town Center
- ☐ Urban Residential or CBD

How does the roadway/facility function in the community?

- ☐ High-speed, primary corridor with limited access
- ☒ Moderate speed, major corridor between towns/regions
- ☐ Low to moderate speed corridor between towns/regions
- ☐ Moderate speed, major street connecting residential areas to a town center or major connector
- ☐ Low to moderate speed street connecting residential areas with other streets
- ☐ Primarily or exclusively a residential street

What is the federal functional classification of the road?

- ☐ Interstate
- ☐ Urban Principal Arterial
- ☐ Urban Minor Arterial
- ☐ Urban Collector
- ☒ Rural Principal Arterial
- ☐ Rural Minor Arterial
- ☐ Rural Major Collector
- ☐ Rural Minor Collector

Is the proposed project on the National Highway System? ☐ **Yes** ☒ **No**

Does the project have any Intelligent Transportation System Components?

☐ **Yes** ☒ **No** **If yes, describe:**_____

Is the project a footprint road project? ☐ **Yes** ☒ **No**

Is the project a footprint bridge project? ☐ **Yes** ☒ **No**

Provide whatever information is available to characterize the current, general use of the facility (attach traffic counts).

CHARACTERISTIC	USE/DATA	DATA SOURCE	NOT AVAILABLE/ Comments
Number of Lanes	2	SIA	
Lane Width	11-feet	SIA	
Shoulder Width	0-feet	SIA	
Sidewalk Availability/Width	Right 4-feet	SIA	
Bicycle Facility Availability/Width	None		
Existing Right of Way	Unknown – approximated 40-feet	Property Deed	
Current Average Annual Daily Traffic (AADT)	23000	SIA	
Current Peak Hour Vehicular Volume	2300		Assume 10% ADT
Current Peak Hour Bicycle Traffic	Unknown		
Current Peak Hour Pedestrian Traffic	Unknown		
Percent Truck Traffic	8%	SIA	
Current Transit Operations/Facilities	None	Survey	
Traffic Control (signal, flash, signs, etc.)	Stop Sign	Survey	
Roadway Lighting	None	Survey	
Pavement Condition and Markings	Good	Inspection Report	
Posted Speed Limit	30 MPH	Field Investigation	
85^{th} Percentile Speed	N/A		

PART III - TRANSPORTATION NEEDS ASSESSMENT

Choose a project type — Roadway, Sidewalk or Multiuse Path; Bridge or Other. Answer the questions that apply to the proposed project. Depending on the nature of the project, not all questions need to be answered. For all projects, answer For All Projects.

Roadway, Sidewalk, Multiuse Path

- ☐ **Preventive Maintenance**
- ☒ **Rehabilitation/Resurfacing**
- ☐ **Reconstruction**
- ☐ **Widening**
- ☐ **New Facility**
- ☐ **Intersection, Roundabout or Traffic Signal Improvements**
- ☐ **New Interchange or Interchange Reconfiguration**
- ☒ **Safety**

PART IV - PUBLIC PROCESS

Please describe the public process associated with the project to date.

☐ **None to Date**

The Board of Selectmen has held several public meetings to inform the public of the current status of the bridge. The results of the meetings have lead overwhelming public support for the project. The project, as discussed will result in a rehabilitated structure that will continue to carry all vehicles for the foreseeable future and will improve public safety. Additionally, the current financial burden to the Town of detouring school busses and emergency response vehicles around the bridge site will be lifted. The historical integrity of the bridge will be maintained with a rehabilitation program, which is of great importance to the public

There is no opposition to this project. The Town would like to emphasize that there is an overwhelming public support for this project.

In the spirit of cooperation, the Town of Freetown is willing to complete the design for the rehabilitation of Bridge No. F-09-003 (3KQ).

What is the expected level of community interest in the project?

☒ **High** ☐ **Medium** ☐ **Low** ☐ **Unknown**

Describe issues of concern raised by the public during the public process to date.

The public is very concerned that the posting of the structure at 6-Tons precludes its use by emergency response vehicles and school busses, as well as other commercial vehicles. The safety of the people of Freetown is affected by the increased response time by the Fire Department, and emergency response vehicles. Secondly, the Town its expense has re-routed, rescheduled, and added additional school busses to detour around the bridge. The inability of the bridge to support commercial truck traffic affects local businesses, and will affect the long-term economic vitality of the Town. All trucks must be detoured around the bridge. Finally, the detour re-routes commercial traffic through residential neighborhoods along narrow, winding roads and across Town lines also impacting the neighboring Town of Berkley.

What is the condition of the facility, e.g. extent of cracking, deterioration, rideabiltiy/walkability, surface condition, structural adequacy, etc.? Include a pavement management system (PMS) condition rating from a MassHighway approved PMS, as appropriate, and attach photo documentation with this submittal showing typical facility surface or site conditions.

Bridge F-09-003 (3KQ) was classified as structurally deficient during an October 2006 bridge inspection. The results of a November Bridge Rating resulted in a 6-Ton maximum gross weight posting. Photos of the bridge can be found in attachment A.

What year was the last repair made to the facility (at minimum a preventative maintenance treatment)?

There have been no major repairs or rehabilitations made to the bridge.

What repair was made to the facility? (Use repair typed above and describe)

None

What is the crash history or other safety concerns of the facility? (For safety projects, consult MassHighway's Traffic Division for more detailed analysis requirements).

The structural integrity of the bridge, and the lack of an adequate bridge barrier and approach guardrails pose a significant safety hazard to the traveling public. The sidewalk width at the bridge site is sub-standard, and poses a safety hazard to pedestrians walking along the roadway and bridge.

Are there mobility issues for motorists, bicyclists or pedestrians? (As an alternate to this question, attach Transportation Evaluation Criteria Form.)

Truck, school bus, and emergency vehicle traffic has been detoured around the bridge because of the 6-Ton load posting of the bridge. The detour re-routes commercial traffic through residential neighborhoods along narrow, winding roads and across Town lines also impacting the neighboring Town of Berkley. The Town has incurred additional costs for the detouring of school busses and emergency response vehicles.

Are there congestion issues? Provide level of service analysis results if necessary. (As an alternate to this question, attach Transportation Evaluation Criteria Form.)

There are no congestion issues at the bridge site along Route 79, however the detour has increased the congestion along local roads in neighborhoods surrounding the bridge site.

What other conditions exist that warrant this project? (As an alternate to this question, attach Transportation Evaluation Criteria Form.)

The bridge is a historic structure within the Historic District of Assonet and has strong local support for rehabilitation to save the bridge.

Evaluate the impact of the project on the following resources/environmental conditions. If major impact", "minor impact", or "will improve" are selected, describe below. (As an alternate to this question, attach Transportation Evaluation Criteria Form.)

RESOURCE/ CONDITION	MAJOR IMPACT	MINOR IMPACT	NO IMPACT	WILL IMPROVE	UNKNOWN
Cultural Resources			**X**		
Wetlands			**X**		
Hazardous Materials			**X**		
Air Quality			**X**		
Noise			**X**		
Other					

Bridge

- ☐ **Maintenance**
- ☒ **Rehabilitation**
- ☐ **Replacement**
- ☐ **New or Widening**

What is the bridge rating and date of inspection?

The date of the previous inspection is 10/2006.

The date of the previous bridge rating is 11/2006.

The bridge rating is 10 Tons.

The bridge posting is 6 Tons.

☒ **Structurally Deficient?** ☒ **Functionally Obsolete?**

☒ **Posted?** ☐ **Unknown?**

What is the condition of the bridge elements?

The bridge arches are classified as structurally deficient. Individual stones have fallen out of the arch ring creating a serious concern about the stability and integrity of the structure. The bridge railings are sub-standard, and not crash-worthy.

What is the condition of other infrastructure elements?

The roadway and traffic elements are adequate. There is only one sidewalk with a width that is sub-standard. There are no guardrails leading to the bridge along the roadway approaching the bridge.

What is the schedule of preventative maintenance?

There is no evidence of any preventative maintenance to the bridge.

If a new bridge or a bridge that does not meet current eligibility requirements, describe why the project is proposed.

Not Applicable

Other

- ☐ **New or Expanded TDM/Park and Ride Lot**
- ☐ **New or Expanded Traffic Management System**
- ☐ **Traffic Calming, Streetscape, Lighting, or Transit Improvements**
- ☐ **Intelligent Transportation Systems**
- ☐ **Other**

Describe the conditions that warrant the project.

Bridge No. F-09-003 (3KQ) is a historic stone masonry arch bridge classified by MassHighway as structurally deficient and has a 6-Ton posted maximum gross vehicle weight limit. This vehicle restriction to travel along Route 79 (Elm Street), a primary route through Freetown between Route 24 and Route 140 requires emergency response vehicles, school busses, and other commercial traffic to follow a detour around the bridge through residential neighborhoods and across Town lines along narrow and winding roads. These detours have affected emergency vehicle response time, and could impact the economy of Freetown.

Repairs to this bridge and approach roadway are vital to the safety of the traveling public and the economic vitality of the TOWN. If the needed repairs are not made to the bridge, the structure will continue to deteriorate until such time that the bridge will be closed to all traffic.

For All Projects

Describe Right of Way Issues

- ☒ **Probably adequate**
- ☐ **Probably will require takings**
- ☒ **Probably will require easements and/or rights of entry**
- ☐ **Unknown**

Describe known project area concerns or constraints. Bridge F-09-003 (3KQ) is a historic structure, and carries Route 79 over the Assonet River. The historic nature of the bridge and surrounding Historic District of Assonet in the village of Freetown constrains the project to rehabilitation only. The bridge will be rehabilitated such that the safety of the traveling public is improved, and the historic nature of the bridge is maintained.

Describe the project's effect on multimodal accommodation. The rehabilitation of the bridge will have the effect of re-opening the bridge to all vehicles, and provide a safer structure to cross for vehicles and pedestrians. There will be no change in use.

MASSACHUSETTS HIGHWAY DEPARTMENT – DISTRICT 5

PROJECT INITIATION FORM (PIF)

THE COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS HIGHWAY DEPARTMENT

PROJECT INITIATION FORM (PIF)

To:

From:

Contact Information:

Date:

Project Reference No:

PART I - LOCATION IDENTIFICATION AND PROJECT NEED RESTATEMENT

A. Municipality: Town of Freetown

B. Route and/or Street(s): Route 79 (Elm Street)

C. Bridge ID Number (if applicable): F-09-003 (3KQ)

D. Is this a state administered highway? **Yes** ☐ **No** ☒

E. Location description or estimated project limits by mile marker and station:
The project limits will include Bridge No. F-09-003 (3KQ) and approximately 350-feet of approach roadway reconstruction. The limits of work will be along Route 79 (Elm Street and Mill Street) from Station 10+00 to Station 14+00 approximately. See attached Plan.

F. Provide a brief restatement of the project need:
Bridge No. F-09-003 (3KQ) is a three span, dry-laid, historic stone masonry arch bridge, built in 1822 that carries Route 79 (Elm Street) over the Assonet River in the village of Freetown, Massachusetts. An October 4, 2006 Inspection Report by MassHighway Bridge Inspection Unit rated the bridge arch ring as structurally deficient. The inspection report noted evidence that several of the stones had fallen since the previous inspection. A December 2006 Bridge rating report found the controlling inventory load rating for the bridge to be 10.8-Tons. MassHighway subsequently posted the bridge for a maximum gross vehicle weight of 6-Tons, recognizing the long-term structural stability of the bridge. Route 79 (Elm Street) is the primary route through Freetown, and the closure of the Elm Street Bridge to vehicles over 6-Tons has resulted in the detouring of emergency response vehicles, school busses, and other

commercial traffic. Repairs to this bridge and approach roadway are vital to the safety of the traveling public and the economic vitality of the TOWN.

If the needed repairs are not made to the bridge, the structure will continue to deteriorate until such time that the bridge will be closed to all traffic. The bridge has been classified as eligible for designation as a historic place, and is an integral part of the Assonet Historic District in the village of Freetown.

PART II- PROJECT TYPE AND DESCRIPTION

G. ☒ Transportation System Preservation

Examples include maintenance, resurfacing, and reconstruction of roadways, sidewalks and multiuse paths. Examples also include maintenance, rehabilitation and replacement of bridges.

☐ **a. Roadways, Sidewalks, and Multiuse Paths**
- ☐ **Maintenance**
- ☐ **Resurfacing**
- ☐ **Reconstruction**

☒ **b. Bridges**
- ☐ **Maintenance**
- ☒ **Rehabilitation**
- ☐ **Replacement**

☐ **c. Other (Define below)**

☐ **Transportation System Improvement or Expansion**

Examples include construction of new facilities; widening of roadways, intersections, sidewalks, or multiuse paths; roadside modifications, and other system enhancements.

- ☐ New Roadway, Sidewalk or Multiuse Path
- ☐ Widened Roadway, Sidewalk or Multiuse Path
- ☐ Intersection, Roundabout, Traffic Signal Improvements
- ☐ New Interchange or Interchange Reconfiguration
- ☐ Median, Roadside Safely, or Signage Improvements
- ☐ Traffic Calming, Streetscape, Lighting, or Transit Enhancements
- ☐ New or Widened Bridge
- ☐ New or Expanded TDM/Park & Ride Lot
- ☐ New or Expanded Traffic Management System (TMS)
- ☐ Other _____

Provide a brief description of the project: The project scope will include repairing the bridge structure such that the historic integrity of the bridge is maintained while increasing the load carrying capacity of the structure to carry statutory vehicles. Additionally, safety improvements will be made to the bridge and approach roadway. The bridge arches will be strengthened so that the maximum load posting of the bridge can be removed, crash-worthy bridge railings will be added to the bridge, approach guardrails will be added to the roadway approaching the bridge,

and adequate sidewalks will be added. All of these improvements will provide greater safety to the public.

Is this a footprint road or bridge project? ☐ ***Yes*** ☒ ***No***

PART III - PROJECT PLANNING SUMMARY

H. Please indicate the planning approach for this project:

☒ **Project Need Form** ☐ **Project Planning Report**

☒ **Other:** Bridge Inspection Report, Bridge Rating Report

I. Briefly summarize the project context (surrounding land uses, nearby cultural and environmental resources, etc.)

Bridge No. F-09-003 (3KQ) is located in the Village of Freetown which is a mixed use commercial and residential zone. The immediate abutters of the bridge are home-owners. The bridge carries Route 79 over the Assonet River. The ADT for Route 79 is 23000, with a 8% Truck Traffic. There will be no impact to the River, as this project is a rehabilitation, not a replacement.

J. Briefly summarize the transportation functions (land access, regional connectivity, multimodal accommodation, etc.)

Route 79 (Elm Street) is the primary route through Freetown, and the closure of the Elm Street Bridge to vehicles over 6-Tons has resulted in lengthy detouring of emergency response vehicles, school busses, and other commercial traffic through residential neighborhoods. Repairs to this bridge and approach roadway are vital to the safety of the traveling public and the economic vitality of the TOWN. Route 79 is the most direct route that makes a connection between Route 24 and Route 140 through Freetown, with the closure of this bridge, emergency vehicle response time is affected and the school department has re-routed, rescheduled, and added buss routes.

K. Briefly describe the alternatives considered, if applicable.

There are no viable alternates to the rehabilitation of Bridge No. F-09-003 (3KQ). The bridge is a historic structure, and is abutted by historic homes in the historic Assonet District located in the village of Freetown, and therefore, replacement is not an option. Long-term closure of the bridge is not an alternative, because all detours are long and impractical (see attached locus map) through residential neighborhoods across Town lines and along narrow and winding roads.

L. Please describe the rationale for selecting the proposed alternative whether or not multiple alternatives were considered

The only long-term alternative is rehabilitation. A short term mitigation to vehicle detouring is to erect a temporary bridge to carry vehicles over the existing bridge. This alternate is not

a practical or cost-effective solution because the geometry of the existing bridge will only accommodate a single-lane structure, and will require a signal system for three origins of vehicles. There is a strong feeling within the Town that a permanent, temporary bridge is an unacceptable solution.

M. Do you anticipate that the project will require a Design Exception?

☐ **Yes** ☒ **No**

N. Estimated Construction Cost: $2,000,000.00

PART IV - PLANNING PUBLIC OUTREACH SUMMARY

O. Public Outreach Activities ☒ **Yes** ☐ **No (Describe below)**

If Yes, please indicate whether the following public outreach activities occurred?

☒ **Local Issues Meeting** ☒ **Individual Outreach Meetings** ☒ **Alternatives Presentation Meeting** ☐ **Other (Describe below)**

Please describe the date, format, attendance, and outcome of meetings, if applicable.
Board of Selectmen for the Town have opened their meetings to the public for discussion of the bridge on the following dates:
February 27, 2007
March 15, 2007
April 16, 2007
May 28, 2007
The results of the meetings have lead overwhelming public support for the project. The project, as discussed will result in a rehabilitated structure that will continue to carry all vehicles for the foreseeable future and will improve public safety. Additionally, the current financial burden to the Town of detouring school busses and emergency response vehicles around the bridge site will be lifted. The historical integrity of the bridge will be maintained with a rehabilitation program, which is of great importance to the public.

P. What is the level of community interest in the project?

☒ **High** ☐ **Medium** ☐ **Low**

What is the current level of community support?

☒ High ☐ Medium ☐ Low

Please identify the nature and extent of any known opposition to the project?:
There is no opposition to this project. The Town would like to emphasize that there is overwhelming public support for this project.

Q. Environmental Coordination Activities ☒ Yes ☐ No

If Yes, please indicate board/agency coordinated with:

☒ **Wetlands/Waterways**
☒ Local Conservation Commissions
☐ Local Water Districts
☐ MA DEP
☐ US Army Corps of Engineers
☐ US Coast Guard
☐ US EPA
☐ MA CZM Office
☐ Others (please list)

_____
_____

☒ **Endangered Species/Habitat**
☒ Local Conservation Commissions
☐ MA DEP
☐ MA Division of Fisheries and Wildlife
☐ US EPA
☐ Others (please list)

_____
_____

☒ **Hazardous Materials**
☐ Local Health Boards
☒ Local Fire Department
☐ MADEP
☐ US EPA
☐ Others (please list)

_____
_____

☒ **Cultural Resources**
☒ Local Historic Commissions
☒ MA Historic Commission
☐ Tribal Historic Preservation Officer
☐ Others (please list)

_____
_____

☐ **Section 4f Resources**
☐ MADCR
☐ Local Parks Department
☐ Local Planning Department
☒ Local Historic Commission
☒ MA Division of Fisheries and Wildlife
☐ EOEA Division of Conservation Services
☐ National Park or Forest Service
☐ Others (please list)

_____
_____

☐ **NEPA/MEPA**
☐ EOEA MEPA Office
☐ US EPA
☐ Lead Federal Agency (FHWA)
☐ Others (please list)

_____
_____

Anticipated MEPA Documentation Required
☐ ENF
☐ EIR
☒ None

Anticipated NEPA Documentation Required
☐ CE
☐ EA
☐ US
☒ None

PART V - PRELIMINARY PROJECT CATEGORY AND FUNDING PROGRAM

R. Anticipated Project Type (based on MassHighway specific categories):
Bridge Rehabilitation

S. Anticipated Funding Program:

- ☐ National Highway System (NHS)
- ☐ Surface Transportation Program (STP)
- ☐ Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- ☒ Bridge Replacement and Rehabilitation Program
- ☐ Interstate Maintenance
- ☐ Non-Federal Aid
- ☐ State Aid Roadways
- ☐ High Priority Project (HPP)
- ☐ Others/Non Transportation Improvement Program (please identify)

_____

_____

PART VI- PROPOSED PROJECT MANAGEMENT PLAN

Please describe how you expect this project to proceed. Who will be responsible for Design? Permitting? Right-of-Way? Construction Management? Etc.

T. Design (Also, Specify Lead Person/Department/Division)

☐ **City/Town** ☐ **MassHighway** ☒ **Other**

In the spirit of cooperation, the Town of Freetown is willing to complete the design for the rehabilitation of Bridge No. F-09-003 (3KQ).

U. Permitting (Also, Specify Lead Person/Department/Division)

☐ **City/Town** ☐ **MassHighway** ☒ **Other** _____

V. Right-of-Way (Also, Specify Lead Person/Department/Division)

☒ **City/Town** ☐ **MassHighway** ☐ **Other** _____

W. Construction (Also, Specify Lead Person/Department/Division)

☐ **City/Town** ☒ **MassHighway** ☐ **Other** _____

PART VII— PRC PROJECT REVIEW (To be completed by PRC Staff)

Comments/observations on project need, type and description:

Comments/observations on planning and public process:

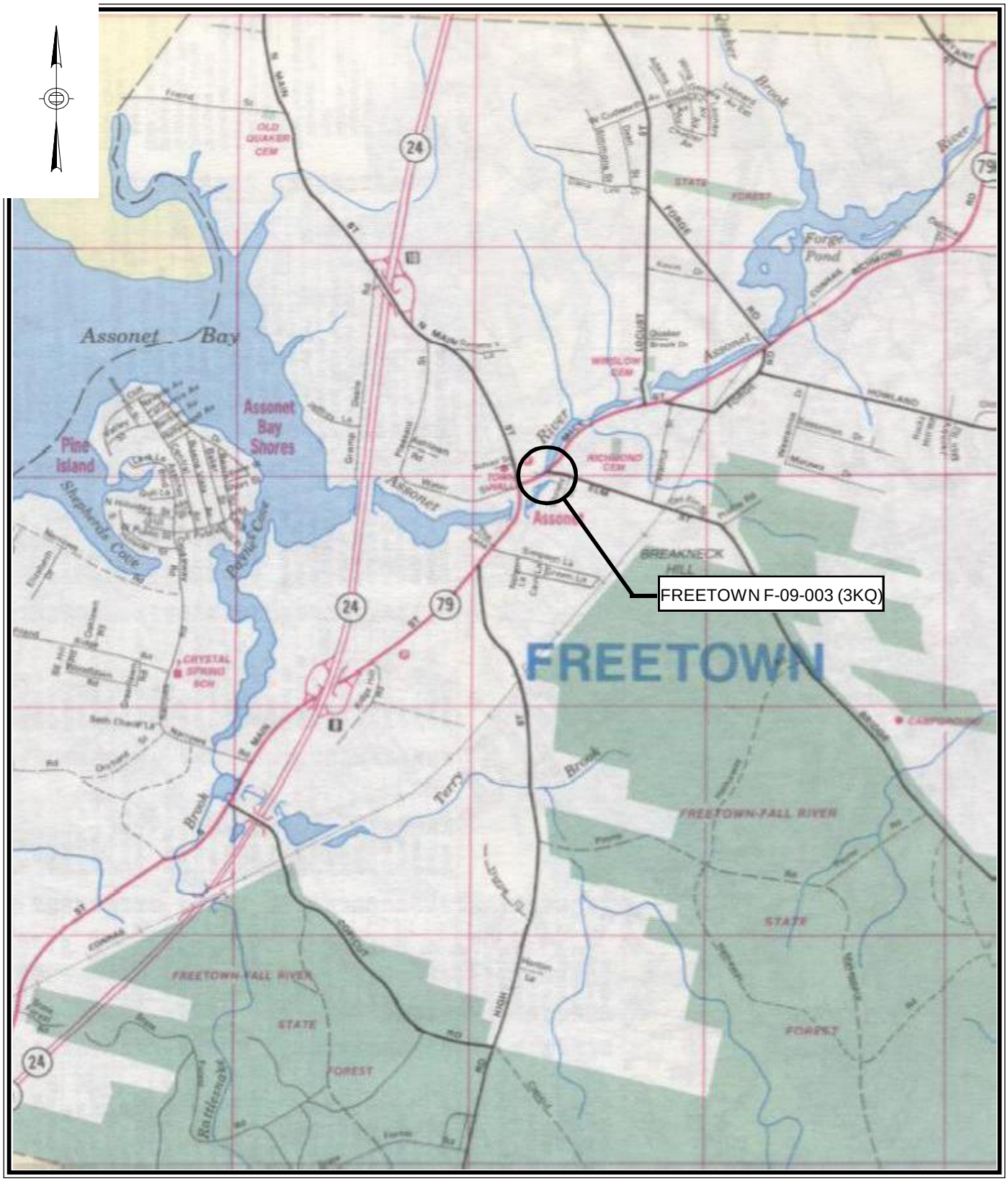
Comments on Project Category and Funding Program Applicability:

Comments on Proposed Management Plan:

Project Review	☐ **Favorable**	☐ **Unfavorable**
Assign PROJIS Number	☐ **Yes**	☐ **No**
Provide Design and Environmental Funding	☐ **Yes**	☐ **No**
Recommend Programming Review by MPO	☐ **Yes**	☐ **No**

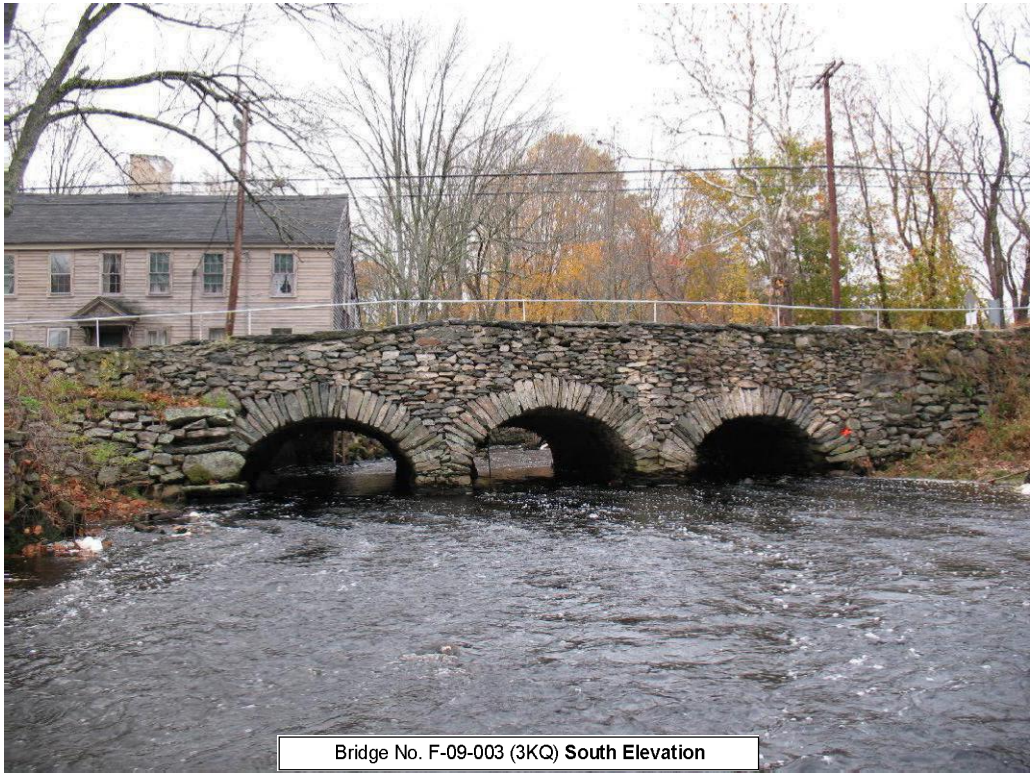
PROJIS Number (if applicable): _____

PROJECT LOCUS MAP



LOCATION MAP

PROJECT BRIDGE PHOTOS



Bridge No. F-09-003 (3KQ) **South Elevation**

Bridge No. F-09-003 (3KQ) **North Elevation**

Bridge No. F-09-003 (3KQ) **East Approach**

Bridge No. F-09-003 (3KQ) **West Approach**

Bridge No. F-09-003 (3KQ) **Bridge Deck and Railings**

Bridge No. F-09-003 (3KQ) **Historical Construction Date**

Bridge No. F-09-003 (3KQ) **North Bridge Railing**

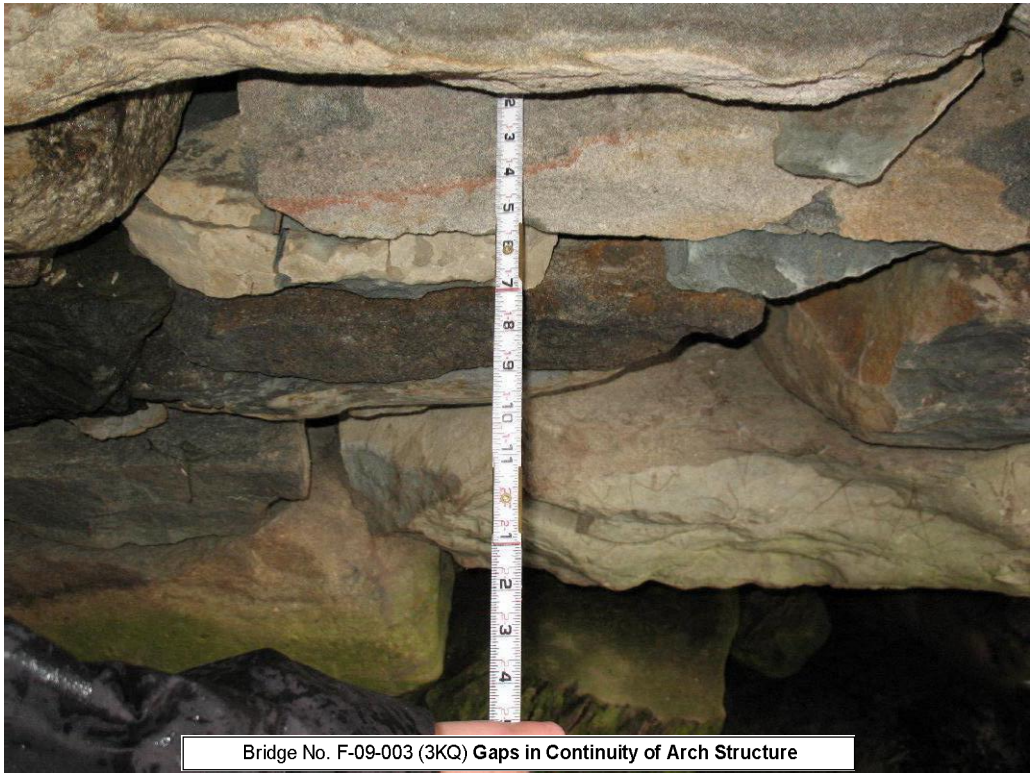
Bridge No. F-09-003 (3KQ) **North Bridge Railing**

Bridge No. F-09-003 (3KQ) **South Bridge Railing**

Bridge No. F-09-003 (3KQ) **Typical Bridge Underside**

Bridge No. F-09-003 (3KQ) **Typical Bridge Underside**

Bridge No. F-09-003 (3KQ) **Gaps in Continuity of Arch Structure**



Bridge No. F-09-003 (3KQ) **Gaps in Continuity of Arch Structure**

Bridge No. F-09-003 (3KQ) **Gaps in Continuity of Arch Structure**

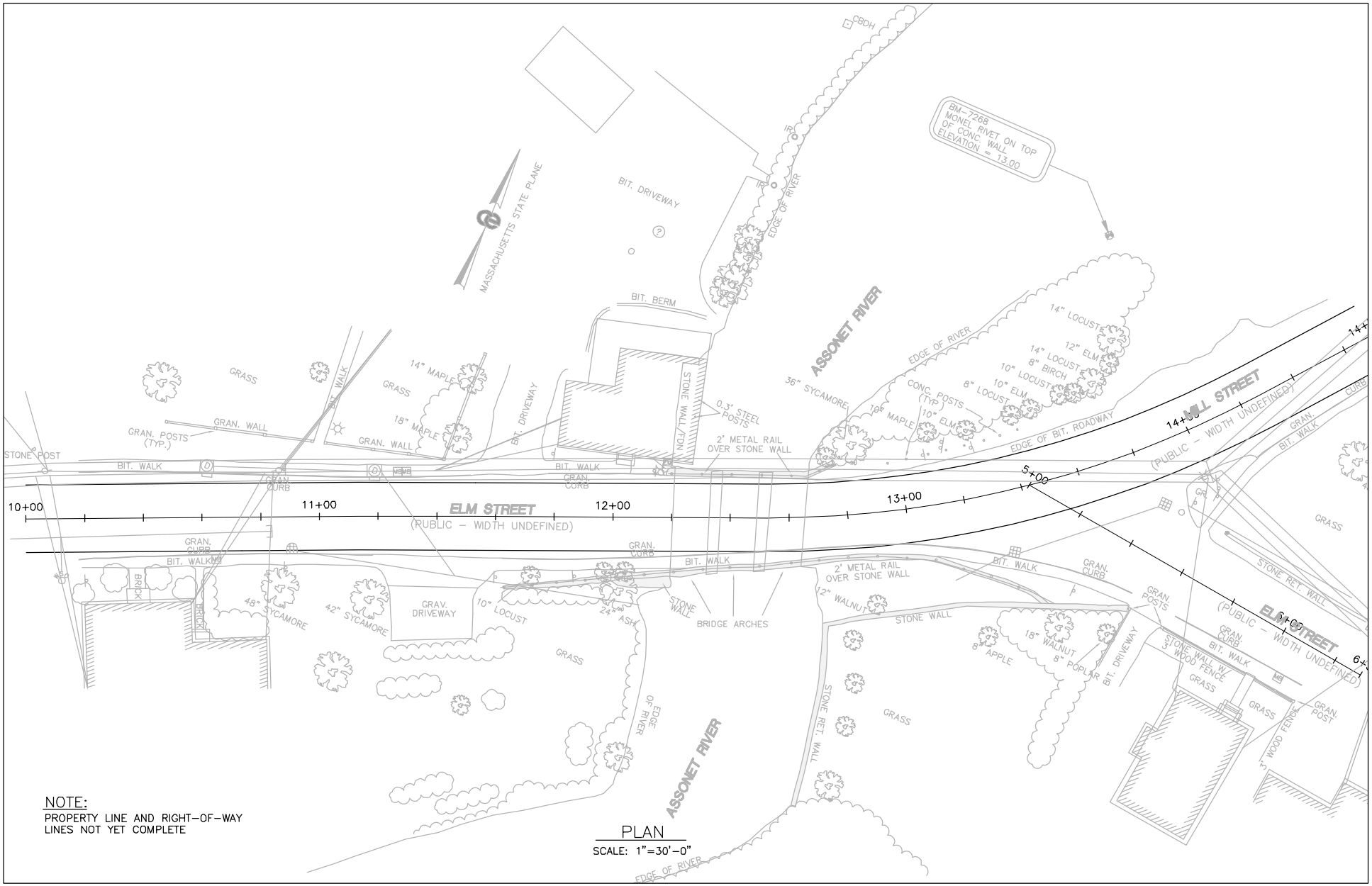
Bridge No. F-09-003 (3KQ) **Gaps in Continuity of Arch Structure**

Bridge No. F-09-003 (3KQ) **Typical Load Path Continuity**

Bridge No. F-09-003 (3KQ) **Typical Load Path Continuity**

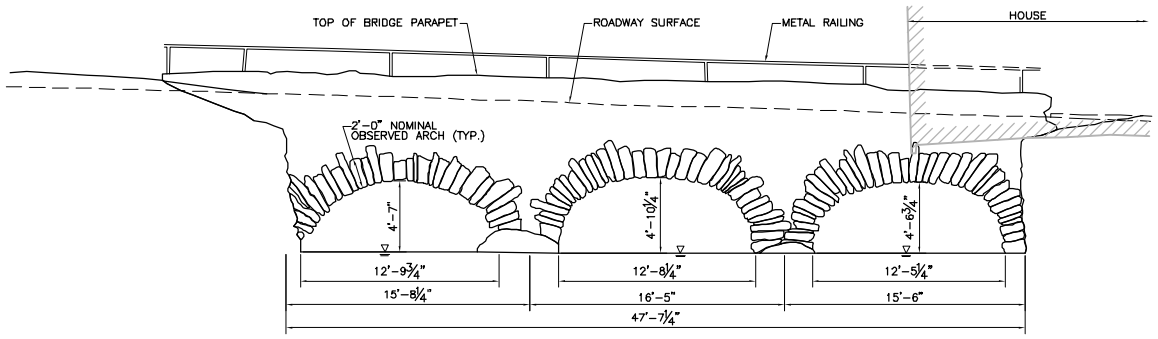
Bridge No. F-09-003 (3KQ) **Typical Load Path Continuity**

PROJECT BRIDGE SKETCHES



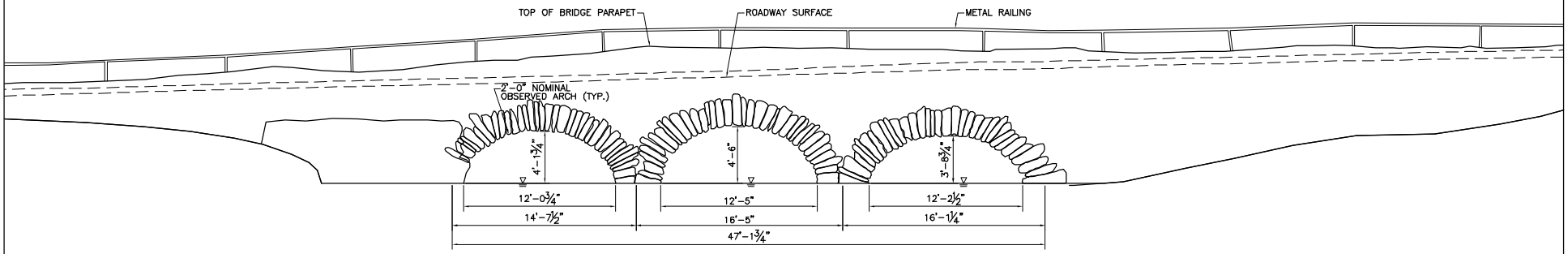
NOTE:
PROPERTY LINE AND RIGHT-OF-WAY LINES NOT YET COMPLETE

PLAN
SCALE: 1"=30'-0"



NORTH BRIDGE ELEVATION

SCALE: ⅛" = 1'-0"



SOUTH BRIDGE ELEVATION

SCALE: ⅛" = 1'-0"

MASSACHUSETTS HIGHWAY DEPARTMENT

BRIDGE INSPECTION REPORT
OCTOBER 4, 2006

MASSACHUSETTS HIGHWAY DEPARTMENT

STRUCTURES INSPECTION FIELD REPORT

ROUTINE ARCH & SPECIAL MEMBER INSPECTION

2-DIST	B.I.N.	BR. DEPT. NO.
05	3KQ	F-09-003

CITY/TOWN	8.-STRUCTURE NO.	11-Kilo. POINT	41-STATUS	90-ROUTINE INSP. DATE
FREETOWN	F09003-3KQ-MUN-NBI	004.892	A:OPEN	OCT 4, 2006

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	YR REHABD (NON 106)
ST 79 ELM ST		1822	0000	0000

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	DIST. BRIDGE INSPECTION ENGINEER
WATER ASSONET RIVER	Urban Arterial	D. A. Palmer

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER
Masonry Arch - Deck	Town Agency	Town Agency	D. A. Palmer

DRAFT

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
Not applicable	Sunny	21°C	W. FERRY, D. A. PALMER, M. CONSO

ITEM 58 — DECK: N

		DEF
1. Wearing surface	5	S-A
2. Deck Condition	N	-
3. Spandrel Fill	5	S-A
4. Curbs	7	-
5. Median	N	-
6. Sidewalks	7	-
7. Parapets	N	-
8. Railing	5	M-P
9. Anti Missile Fence	N	-
10. Drainage System	N	-
11. Lighting Standards	N	-
12. Utilities	N	-
13. Deck Joints	N	-
14.	N	-
15.	N	-
16.	N	-

CURB REVEAL (In millimeters)	N	S
	N	100

APPROACHES

		DEF
a. Appr. pavement condition	7	M-P
b. Appr. Roadway Settlement	7	-
c. Appr. Sidewalk Settlement	7	-
d.	N	-

OVERHEAD SIGNS (Attached to bridge) (Y/N): N

		DEF
a. Condition of Welds	N	-
b. Condition of Bolts	N	-
c. Condition of Signs	N	-

ITEM 59 — SUPERSTRUCTURE: 3

		DEF
1. Arch/Arch Ring	3	S-A
2. Keystone Area	3	S-A
3. Stringers	N	-
4. Floorbeams	N	-
5. Spandrel Walls	7	-
6. Spring Lines	N	-
7. Diaphragms/Cross Frames	N	-
8. Conn Plt's, Gussets & Angles	N	-
9. Pin & Hangers	N	-
10. Masonry Joints	N	-
11. Rivets & Bolts	N	-
12. Welds	N	-
13. Deformation/Flattening	3	S-A
14. Member Alignment	N	-
15. Paint/Coating	N	-
16.	N	-

Year Painted	N

COLLISION DAMAGE: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

LOAD DEFLECTION: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

LOAD VIBRATION: *Please explain*
None ( ) Minor ( ) Moderate ( ) Severe (X)

Any Fracture Critical Member: (Y/N): N

Any Cracks: (Y/N): N

ITEM 60 — SUBSTRUCTURE: 5

	Dive	Cur		DEF
1. Abutments			5	
a. Pedestals	N	N		-
b. Bridge Seats	N	N		-
c. Backwalls	N	N		-
d. Breastwalls	N	5		-
e. Wingwalls	N	5		S-P
f. Slope Paving/Rip-Rap	N	N		-
g. Pointing	N	N		-
h. Footings	N	X		-
i. Piles	N	X		-
j. Scour	N	7		-
k. Settlement	N	7		-
l.	N	N		-
m.	N	N		-
2. Piers or Bents			5	
a. Pedestals	N	N		-
b. Caps	N	N		-
c. Columns	N	N		-
d. Pierwalls	N	5		-
e. Pointing	N	N		-
f. Footing	N	X		-
g. Piles	N	X		-
h. Scour	N	7		-
i. Settlement	N	7		-
j.	N	N		-
k.	N	N		-
3. Pile Bents			N	
a. Pile Caps	N	N		-
b. Piles	N	N		-
c. Diagonal Bracing	N	N		-
d. Horizontal Bracing	N	N		-
e. Fasteners	N	N		-

UNDERMINING (Y/N) If YES please explain: N

COLLISION DAMAGE:
None (X) Minor ( ) Moderate ( ) Severe ( )

I-60 (Dive Report): N *I-60 (This Report):* 5

93B-U/W (DIVE) Insp: 00/00/00

X=UNKNOWN N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE R=REMOVED

RTN(1)7-96

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

ITEM 61 CHANNEL & CHANNEL PROTECTION — 7

	Dive	Cur	DEF
1. Channel Scour	N	7	-
2. Embankment Erosion	N	7	-
3. Debris	N	7	-
4. Vegetation	N	7	-
5. Utilities	N	N	-
6. Rip-Rap/Slope Protection	N	N	-
7. Aggradation	N	7	-
8. Fender System	N	N	-

STREAM FLOW VELOCITY: Tidal (X) High ( ) Moderate ( ) Low ( ) None ( )

ITEM 61 (Dive Report): N ITEM 61 (This Report) 7

93b-U/W INSP. DATE: 00/00/00

ITEM 36 TRAFFIC SAFETY

	36	COND	DEF
A. Bridge Railing	0	5	M-P
B. Transitions	N	N	-
C. Approach Guardrail	0	5	M-P
D. Approach Guardrail Ends	N	N	-

WEIGHT POSTING Not Applicable X

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: 00/00/00 EJDMT Date: 00/00/00

Signs In Place (Y=Yes,N=No, NR=NotRequired) Legibility/ Visibility	At bridge E	At bridge W	Other Advance E	Other Advance W

CLEARANCE POSTING Not Applicabl X

	N ft	N in	S ft	S in	meter
Actual Field Measurement		0		0	
Posted Clearance		0		0	

Signs In Place (Y=Yes,N=No, NR=NotRequired) Legibility/ Visibility	At bridge N	At bridge S	Advance N	Advance S

ACCESSIBILITY (Y/N/P)

	Needed	Used
Lift Bucket	N	N
Ladder	N	N
Boat	N	N
Waders	Y	Y
Inspector 50	N	N
Rigging	N	N
Staging	N	N
Traffic Control	N	N
RR Flagger	N	N
Police	N	N
Other:		
	N	N

TOTAL HOURS 8

PLANS (Y/N): N

(V.C.R.) (Y/N): N

TAPE#:

List of field tests performed:

RATING
Rating Report (Y/N): Y
Date: 04/01/1979

(To be filled out by DBIE)
Request for Rating or Rerating (Y/N): Y
If YES please give priority: HIGH (X) MEDIUM ( ) LOW ( )

REASON: Overall deterioration of the arch. ² D.P.

CONDITION RATING GUIDE

(For Items 58, 59, 60 and 61)

	CODE	CONDITION	DEFECTS
	N	NOT APPLICABLE	
G	9	EXCELLENT	Excellent condition.
G	8	VERY GOOD	No problem noted.
G	7	GOOD	Some minor problems.
F	6	SATISFACTORY	Structural elements show some minor deterioration.
F	5	FAIR	All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
P	4	POOR	Advance section loss, deterioration, spalling or scour.
P	3	SERIOUS	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
C	2	CRITICAL	Advance deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
C	1	"IMMINENT" FAILURE	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put it back in light service.
	0	FAILED	Out of service - beyond corrective action.

DEFICIENCY REPORTING GUIDE

DEFICIENCY: A defect in a structure that requires corrective action.

CATEGORIES OF DEFICIENCIES:

M= Minor Deficiency- Deficiencies which are minor in nature, generally do not impact the structural integrity of the bridge and could easily be repaired. Examples include but are not limited to: Spalled concrete, Minor pot holes, Minor corrosion of steel, Minor scouring, Clogged drainage, etc.

S= Severe/Major Deficiency- Deficiencies which are more extensive in nature and need more planning and effort to repair. Examples include but are not limited to: Moderate to major deterioration in concrete, Exposed and corroded rebars, Considerable settlement, Considerable scouring or undermining, Moderate to extensive corrosion to structural steel with measurable loss of section, etc.

C-S= Critical Structural Deficiency - A deficiency in a structural element of a bridge that poses an extreme unsafe condition due to the failure or imminent failure of the element which will affect the structural integrity of the bridge.

C-H= Critical Hazard Deficiency - A deficiency in a component or element of a bridge that poses an extreme hazard or unsafe condition to the public, but does not impair the structural integrity of the bridge. Examples include but are not limited to: Loose concrete hanging down over traffic or pedestrians, A hole in a sidewalk that may cause injuries to pedestrians, Missing section of bridge railing, etc.

URGENCY OF REPAIR:

I = Immediate- [Inspector(s) immediately contact District Bridge Inspection Engineer (DBIE) to report the Deficiency and to receive further instruction from him/her.]

A = ASAP- [Action/Repair should be initiated by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) upon receipt of the Inspection Report].

P = Prioritize- [Shall be prioritized by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

MASSACHUSETTS HIGHWAY DEPARTMENT

STRUCTURES INSPECTION FIELD REPORT

ROUTINE ARCH & SPECIAL MEMBER INSPECTION

2-DIST	B.I.N.	BR. DEPT. NO.
05	3KQ	F-09-003

CITY/TOWN	8.-STRUCTURE NO.	11-Kilo. POINT	90-ROUTINE INSP. DATE	93*-SPEC. MEMB. INSP. DA
FREETOWN	F09003-3KQ-MUN-NBI	004.892	Oct 4, 2006	Oct 4, 2006

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	*YR REHABD (NON 106)
ST 79 ELM ST		1822	0000	0000

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	DIST. BRIDGE INSPECTION ENGINEER
WATER ASSONET RIVER	Urban Arterial	D. A. Palmer

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER
Masonry Arch - Deck	Town Agency	Town Agency	J. S. Dalton

DRAFT

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
Not applicable	Sunny	21°C	W. FERRY, D. A. PALMER, M. CONSO

WEIGHT POSTING

Not Applicable [X]

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: ----- EJDMT Date: -----

Signs in Place (Y=Yes,N=No, NR=NotRequired) / Legibility/ Visibility

At bridge E	At bridge W	Advance E	Advance W

RATING

Request for Rating or Rerating (Y/N): Y — If YES please give priority: HIGH [X] MEDIUM [ ] LOW [ ]

Rating Report (Y/N): Y

Date: 04/01/1979

REASON: Overall deterioration of the arch. ² D.P.

PLANS (Y/N): N

(V.C.R.) (Y/N): N

TAPE#:

SPECIAL MEMBER(S):

	MEMBER	CRACK (Y/N):	WELD'S CONDITION (0-9)	LOCATION OF CORROSION, SECTION LOSS (%), CRACKS, COLLISION DAMAGE, STRESS CONCENTRATION, ETC.	CONDITION PREVIOUS (0-9)	CONDITION PRESENT (0-9)	INV. RATING OF MEMBER H-20	INV. RATING OF MEMBER 3	INV. RATING OF MEMBER 3S2	Deficiencies
A	Item 59.1 - Arch/Arch Ring	N		See remarks in comments section.	6	3	29	39	61	S-A
B										
C										
D										
E										

List of field tests performed:

	I-58	I-59	I-60	I-62
(Overall Previous Condition)	-	6	6	-
(Overall Current Condition)	-	3	5	-

DEFICIENCY: A defect in a structure that requires corrective action.

CATEGORIES OF DEFICIENCIES:

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P = Prioritize- [Shall be prioritized by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

X=UNKNOWN N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE R=REMOVED

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

REMARKS

BRIDGE ORIENTATION

ST 79 Elm Street has an east/west orientation. The bridge is in the tidal zone and the Assonet River flows from north to south.

ITEM 58 - DECK

Item 58.1 - Wearing surface

Random cracks and uneven/rutted areas, especially at the north. There is a 5ft by 3ft patched area that is also settling at the north adjacent to the masonry wall. There is heavy truck traffic causing vibration to the structure from the impact loading. S/A Deficieny. See photo 1.

Item 58.3 - Spandrel Fill

The repaired area on the north side of the wearing surface over the sag in the center barrel continues to settle. S/A Deficiency

Item 58.8 - Railing

The rail is made up of a single steel pipe rail and steel post on masonry walls. The masonry walls are in good condition. The rail on the south side is loose and there is a missing post.

APPROACHES

Approaches a - Appr. pavement condition

Minor cracks in the bit. concrete.

ITEM 59 - SUPERSTRUCTURE

Item 59.1 - Arch/Arch Ring

There are many cracked stones and minor voids throughout as well a some hanging stones.

See Photos for the following S/A Defiency:

There are several more significant voids including two very recent ones in the keystone area of the west barrel, 10ft and 16ft in from the north. One of the stones from these new voids fell during the inspection and the other was in the channel with no marine growth on it yet. The north ends of all three barrels are sagging up to 6 inches +/- with water dripping in this area. The sag in the west barrel starts at the new void 10 feet in from the north and continues to the arch ring. The center barrel was reported to have a sag in only the most recent inspection. The sag extends 15 feet into the barrel and is under a settling patch in the wearing surface. The sag in the east barrel extends 12 feet in from the face of the arch ring. The north side of the roadway above is uneven, contributing unwanted vibration and impact loading in this area.

All of the arch rings appear unchanged from previous photos. However, the west and center rings at the north do not have a uniform radius with some flattening at the top and there is a void under the arch ring at the SE.

Some of the hanging stones are loose and the one in Photos 13 & 14 also fell out during the inspection.

Item 59.2 - Keystone Area

See Item 59.1 Arch/Arch Ring. S/A Deficiency

Item 59.5 - Spandrel Walls

Some minor voids and cracked stones typical for this type of structure.

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

REMARKS

Item 59.6 - Spring Lines
There are no discernible spring lines.

Item 59.13 - Deformation/Flattening
S/A Deficiency: There is a sag in the roof of the arch at the north in all three barrels.There is also water dripping from the roof at the same location and settlement above the center arch in this area. See Item 59.1 Arch/arch Ring

SuperStructure Load Vibration Notes
There is a high percentage of heavy trucks using this road. Unwanted vibration from heavy loads on the uneven wearing surface at the north side could be contributing to the deterioration of the structure.

ITEM 60 - SUBSTRUCTURE

Item 60.1.d - Breastwalls
There are no discernible spring lines. The breastwall areas have many cracked stones and some voids. There is no change to a previously reported void at the bottom of the southeast breastwall/arch ring/wingwall 3in long by 22in high by 18in deep. See Photos 16 & 17.

Item 60.1.e - Wingwalls
Minor voids and cracked stone typical for this type of structure. See Item 60.1.d for a void at the SE corner. **The SE wingwall has a large bulge in the middle. See Photo 17. S/P Deficiency**

Item 60.2.d - Pierwalls
There are no discernible spring lines. The pierwall areas have many cracked stones and some voids.

TRAFFIC SAFETY

Item 36a - Bridge Railing
Nonstandard. See Item 58.8 for condition.

Item 36b - Transitions
Masonry walls and pipe rail continue off of structure.

Item 36c - Approach Guardrail
Masonry walls and pipe rail continue off of structure. See Item 58.8 for condition.

Photo Log
Photo 1 : Cracks, ruts, settling, and patched area, north side
Photo 2 : West arch, north end
Photo 3 : West arch, north end
Photo 4 : West arch, north arch ring: Cracks in two stones appear unchanged
Photo 5 : West arch, north arch ring: Cracked and broken stones appear unchanged
Photo 6 : West arch at keystone area, 10-11ft from north at beginning of sag: Recent void 1ft L x 6in H x 16in D
Photo 7 : West arch at keystone area, 16-17ft from north: Recent void up to 1.5ft L x 6in W x 1.5ft D
Photo 8 : Middle arch looking north
Photo 9 : Middle arch looking south
Photo 10 : Middle arch at middle near top: Void up to 1.5ft x 1.5ft x 16in D
Photo 11 : Middle arch, 4ft up east side, 11-12ft from south: Void 2ft L x 14in W x 1.5ft D
Photo 12 : East arch at north

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

REMARKS

Photo Log (Cont'd)

Photo 13 : East arch looking south: Loose hanging stone which later fell out
Photo 14 : East arch looking north
Photo 15 : East arch at southwest: Void 20in L x 1ft W x 16in D
Photo 16 : East arch at SE: Void at bottom of arch ring/breastwall/wingwall interface 32in L x 22in H x 18in D
Photo 17 : Bulge in SE wingwall

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 1: Cracks, ruts, settling, and patched area, north side

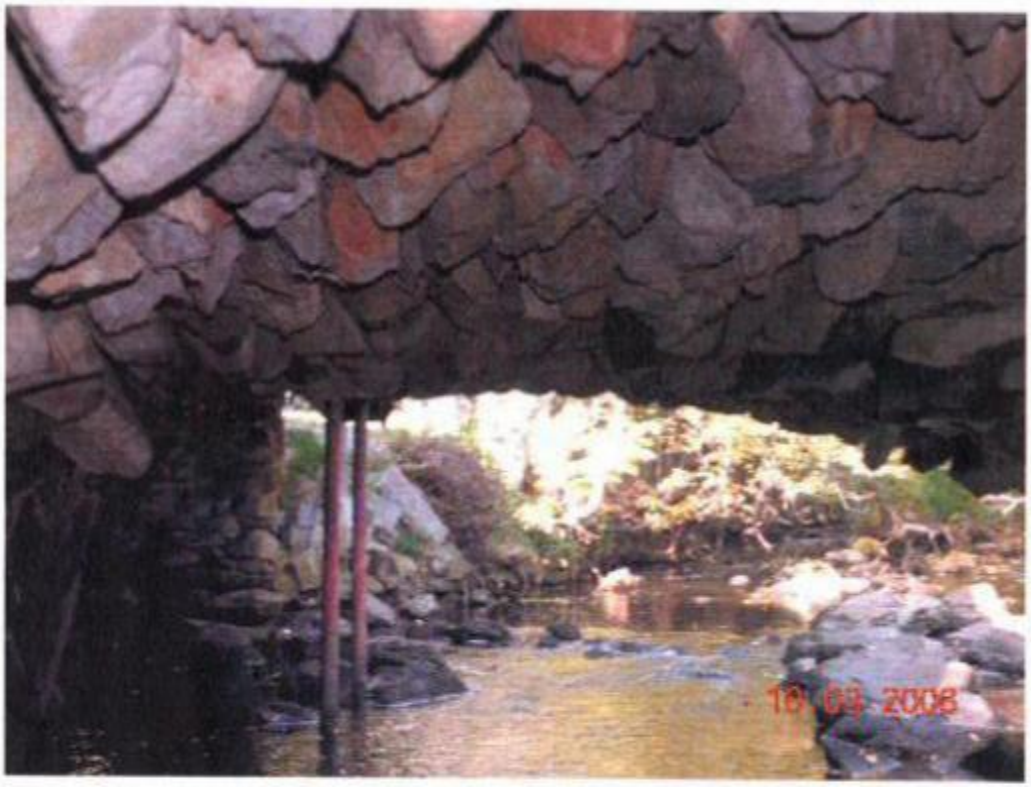


Photo 2: West arch, north end

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 3: West arch, north end

Photo 4: West arch, north arch ring: Cracks in two stones appear unchanged

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 5: West arch, north arch ring: Cracked and broken stones appear unchanged

Photo 6: West arch at keystone area, 10-11ft from north at beginning of sag: Recent void 1ft L x 6in H x 16in D

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 7: West arch at keystone area, 16-17ft from north: Recent void up to 1.5ft L x 6in W x 1.5ft D

Photo 8: Middle arch looking north

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

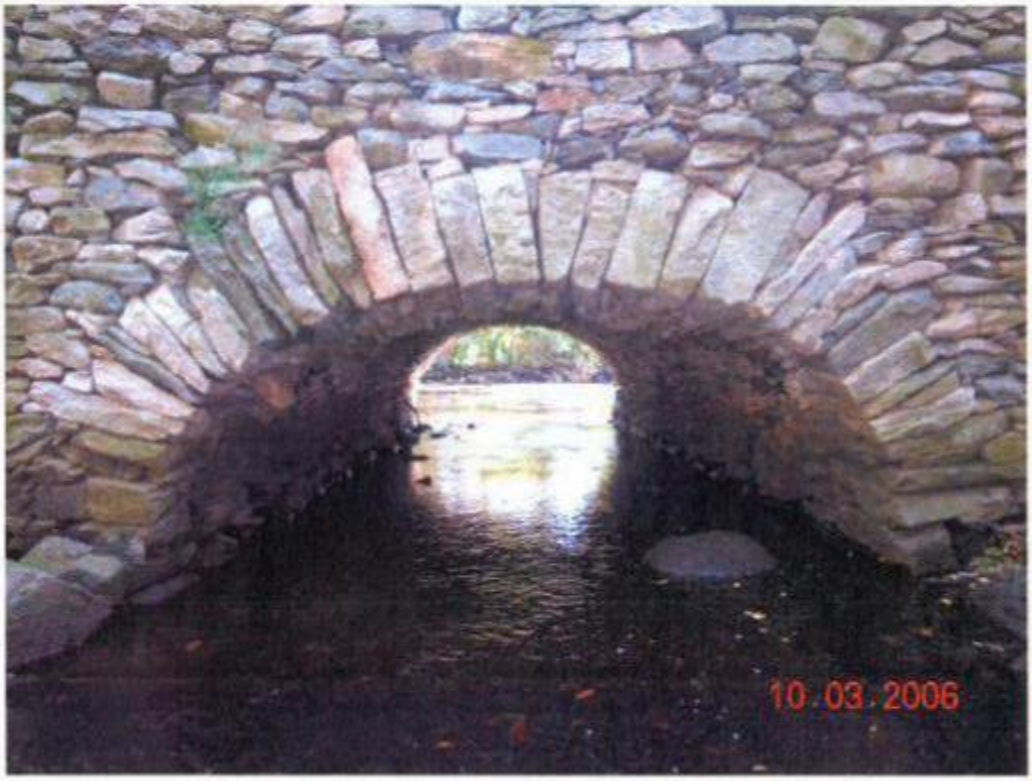


Photo 9: Middle arch looking south

Photo 10: Middle arch at middle near top: Void up to 1.5ft x 1.5ft x 16in D

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 11: Middle arch, 4ft up east side, 11-12ft from south: Void 2ft L x 14in W x 1.5ft D

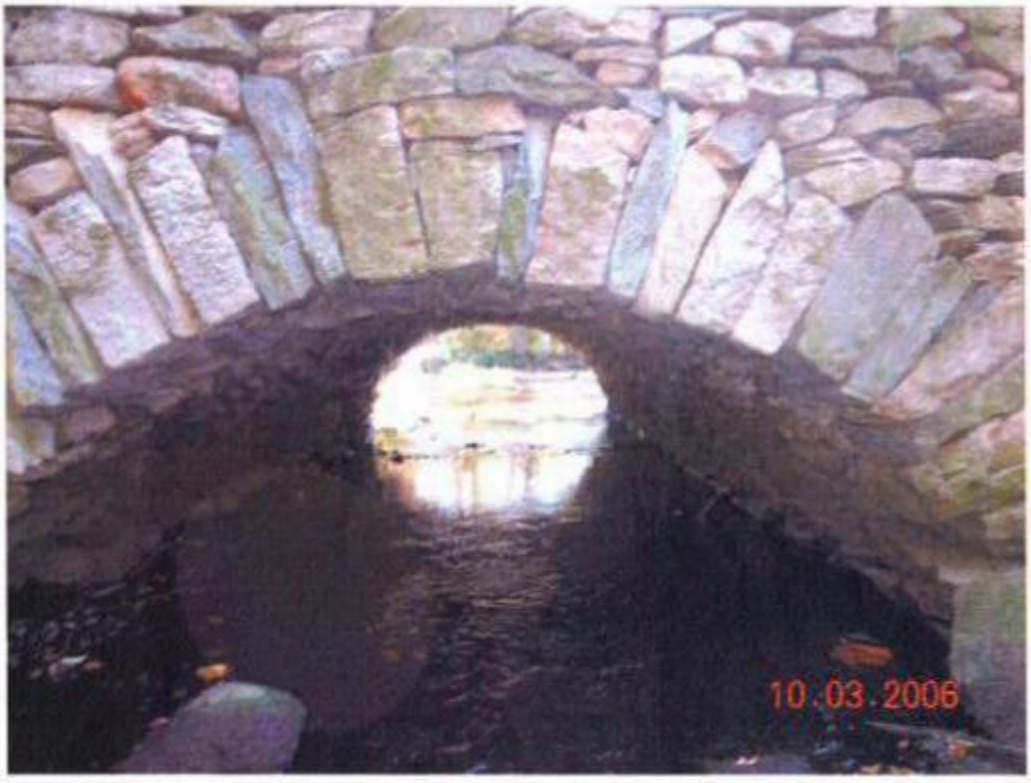


Photo 12: East arch at north

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

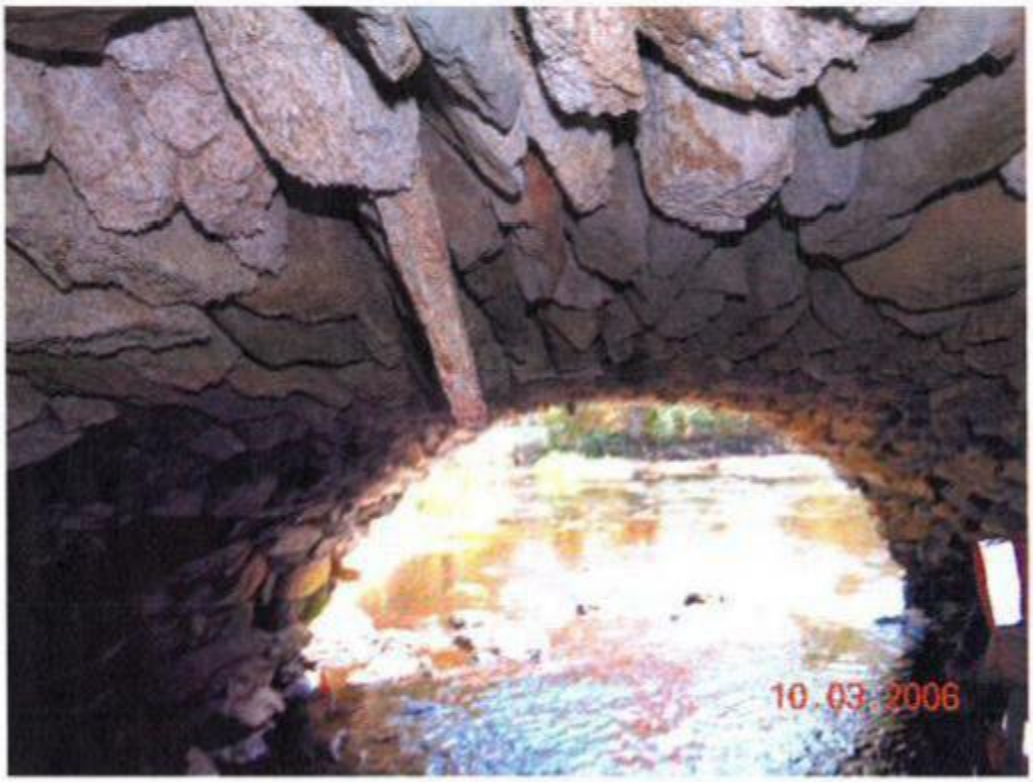


Photo 13: East arch looking south: Loose hanging stone which later fell out

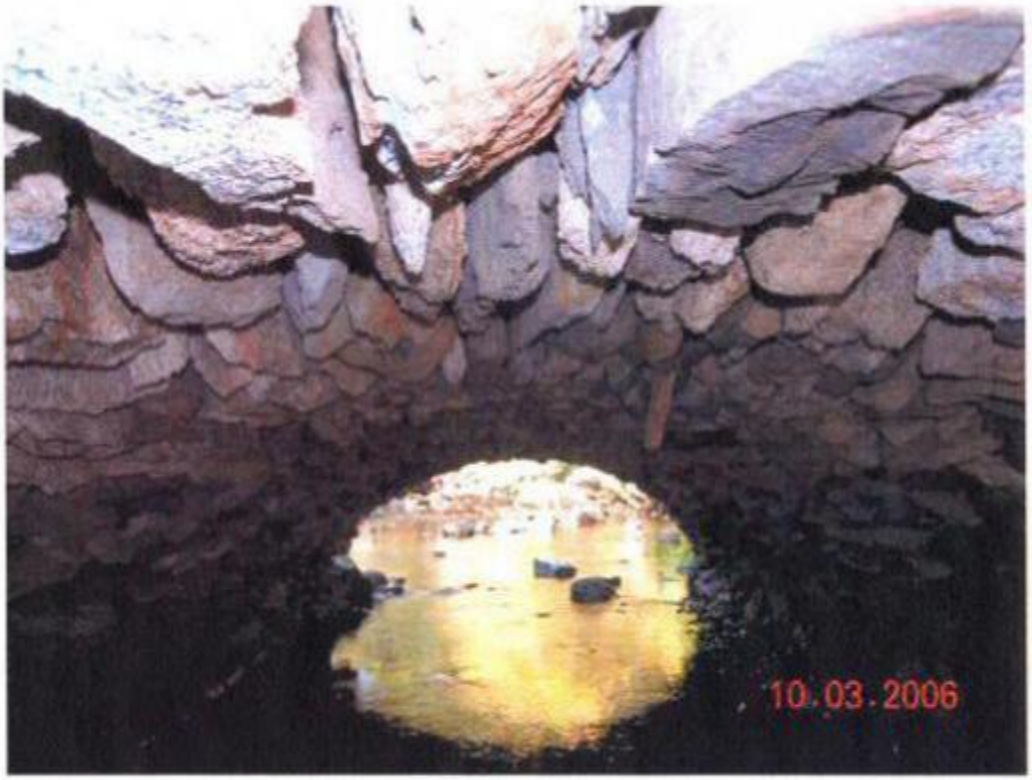


Photo 14: East arch looking north

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

Photo 15: East arch at southwest: Void 20in L x 1ft W x 16in D

Photo 16: East arch at SE: Void at bottom of arch ring/breastwall/wingwall interface 32in L x 22in H x 18in D

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
FREETOWN	3KQ	F-09-003	F09003-3KQ-MUN-NBI	OCT 4, 2006

PHOTOS

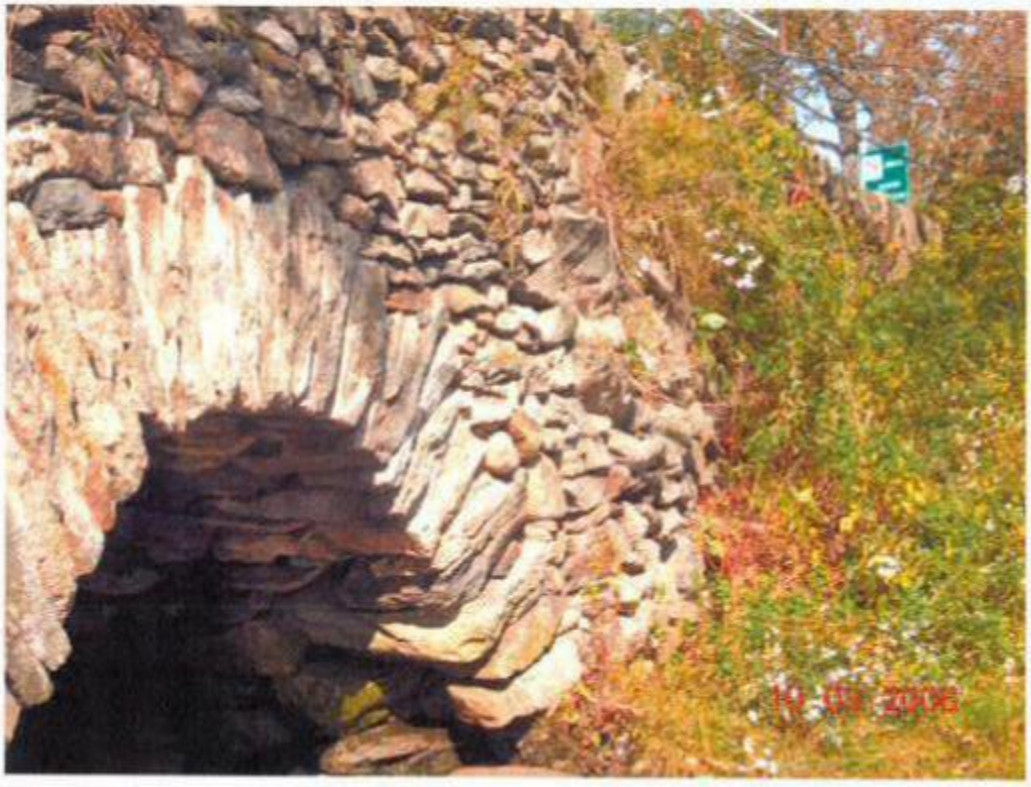


Photo 17: Bulge in SE wingwall

MASSACHUSETTS HIGHWAY DEPARTMENT

UNDERWATER OPERATIONS TEAM

DIVERS ACTIVITY REPORT

2-DIST	B.I.N.	BR. DEPT. NO.
5	3KQ	F-09-003

CITY/TOWN	8-STRUCTURE NO.	LEVEL OF INSP.	93b- INSPECTION DATE
FREETOWN	F09003 3KQ MUN NBI	I	1/26/06

7-FACILITY CARRIED	ACCESS TO BRIDGE	UNDERWATER OPERATIONS ENGINEER
ST 79 ELM ST.	EMBANKMENT	JOHN B. DESMOND

6-FEATURES INTERSECTED	DEPTH	VISIBILITY	TEAM LEADER (DIVE MASTER)	Report submitted by:
ASSONET RIVER	3'	3'	R. BONICA	R. Bonica

BOTTOM CONDITION	CURRENT	TEAM MEMBERS
BLDRS., COBBLES, GRAVEL	SWIFT	W. COLLERAN, A. BONDESON

STORM DAMAGE INSPECTION
(HEAVY RAINS OCTOBER 2005)

- [ ] MAJOR FLOOD DAMAGE
- [ ] MINOR FLOOD DAMAGE
- [ ] DEBRIS BUILDUP
- [X] NO APPARENT FLOOD DAMAGE

Bridge is a three span dry-laid masonry arch. There are random missing and cracked stones.

Left Abutment:

There is a void (missing stones) at the downstream end, one stone above the mudline. (3' L along breastwall, 1.5' L along wingwall, 2.2' Max. H, 3' Max. P (between stones).

There is a void (missing stones) approximately 21' from the downstream end, at the mudline (0.8' L, 0.8' H, 2' P).

Left Pier:

Left Side - There is a void (missing stones) 2' from the upstream end, at the mudline (3' L, 0.7' H, 2.5' P).

Right Side - There is a void (missing stones) 2' from the upstream end, at the mudline (0.8' L, 0.8' H, 1.2' P).

MASSACHUSETTS HIGHWAY DEPARTMENT

BRIDGE RATING SUMMARY
DECEMBER 2006
(COMPLETE REPORT AVAILABLE)

BRIDGE RATING

Prepared for

COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

FREETOWN

ROUTE 79 (ELM STREET)

OVER

ASSONET RIVER

BRIDGE NO. F-09-003 (3KQ)

STRUCTURE NO. F090033KQMUNNBI

(VOLUME 1 OF 2)

NOVEMBER, 2006
Date of Inspection

DECEMBER, 2006
Date of Rating

EK / HNTB a joint venture
Edwards and Kelcey — HNTB Corporation

Submitted by:
EK/HNTB – Joint Venture
343 Congress Street
Boston, MA 02210
(617) 242-9222

INDEX

SUMMARY OF BRIDGE RATING

TOWN: FREETOWN	BRIDGE NO.: F-09-003
CARRIES: ROUTE 79 (ELM STREET)	OVER: ASSONET RIVER
STRUCTURE NO.: F090033KQMUNNBI	BIN: 3KQ

RATINGS (TONS)

Allowable Stress Ratings for Load Posting Purposes Load Ratings in English Tons		
VEHICLE TYPE	INVENTORY	OPERATING
H20	10.8	---
TYPE 3	12.3	---
TYPE 3S2	19.3	---
HS20	19.4	---

MS 18 Load Factor Ratings in Metric Tons Provided in Compliance with the December 1995 FHWA NBIS Coding Guide			
INVENTORY		OPERATING	
Item 66	MS Equivalent	Item 64	MS Equivalent
	MS		MS

A posting recommendation has been made based on the results of this Rating Report. This recommendation is contained in the "Memorandum to the NBIS File" for this bridge, dated _____

_____

Bridge Engineer Date

BREAKDOWN OF BRIDGE RATING (ALLOWABLE STRESS METHOD)

TOWN: FREETOWN	BRIDGE NO.: F-09-003
CARRIES: ROUTE 79 (ELM STREET)	OVER: ASSONET RIVER
STRUCTURE NO.: F090033KQMUNNBI	BIN: 3KQ

BRIDGE ELEMENT	INVENTORY RATING BY WORKING STRESS METHOD				OPERATING RATING BY WORKING STRESS METHOD			
	H20	TYPE 3	TYPE 3S2	HS20	H20	TYPE 3	TYPE 3S2	HS20
West Arch Span (North Side) Spring Line	205.7	147.9	231.7	370.2	---	---	---	---
West Arch Span (North Side) Quarter Point	54.1	60.1	94.4	97.4	---	---	---	---
West Arch Span (North Side) Crown Line	11.5	13.1	20.6	20.7	---	---	---	---
West Arch Span (South Side) Spring Line	125.7	118.6	183.9	226.3	---	---	---	---
West Arch Span (South Side) Quarter Point	26.3	28.9	45.1	47.3	---	---	---	---
West Arch Span (South Side) Crown Line	10.8	12.3	19.3	19.4	---	---	---	---

BREAKDOWN OF BRIDGE RATING (ALLOWABLE STRESS METHOD)

TOWN: FREETOWN	BRIDGE NO.: F-09-003
CARRIES: ROUTE 79 (ELM STREET)	OVER: ASSONET RIVER
STRUCTURE NO.: F090033KQMUNNBI	BIN: 3KQ

BRIDGE ELEMENT	INVENTORY RATING BY WORKING STRESS METHOD				OPERATING RATING BY WORKING STRESS METHOD			
	H20	TYPE 3	TYPE 3S2	HS20	H20	TYPE 3	TYPE 3S2	HS20
Center Arch Span (South Side) Spring Line	80.6	77.0	118.5	145.1	---	---	---	---
Center Arch Span (South Side) Quarter Point	20.1	22.1	34.5	36.2	---	---	---	---
Center Arch Span (South Side) Crown Line	14.3	16.6	26.8	25.8	---	---	---	---
East Arch Span (North Side) Spring Line	97.2	105.6	160.7	173.8	---	---	---	---
East Arch Span (North Side) Quarter Point	35.5	40.2	63.1	64.3	---	---	---	---
East Arch Span (North Side) Crown Line	26.1	29.1	45.6	47.0	---	---	---	---

BREAKDOWN OF BRIDGE RATING (LOAD FACTOR METHOD)

TOWN: FREETOWN	BRIDGE NO.: F-09-003
CARRIES: ROUTE 79 (ELM STREET)	OVER: ASSONET RIVER
STRUCTURE NO.: F090033KQMUNNBI	BIN: 3KQ

BRIDGE ELEMENT	INVENTORY RATING BY LOAD FACTOR METHOD (METRIC TONS)		OPERATING RATING BY LOAD FACTOR METHOD (METRIC TONS)	
	MS 18	MS (EQUIV.)	MS 18	MS (EQUIV.)
Not Required for Masonry Arches				

DESCRIPTION OF BRIDGE

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

Date of Construction:	1822
Original Design Loading:	Unknown
Posted Limit:	18 tons
Bridge Type:	Dry-laid fieldstone arch bridge
Skew:	0^{o}
Spans:	Three (3) spans: east 12’-9”±; center 12’-6”±; west 12’-4”± at spring line
Width of Bridge Deck:	Varies: 32’-9” to 37’-7” out to out
Roadway Width:	Varies: 22’-4” to 25’-8” from sidewalk curb line to the north stone parapet wall
Roadway Surface:	Bituminous concrete roadway pavement
Curbs:	4”± reveal
Sidewalk / Walkway / Median:	One sidewalk: width varies (6’-3” to 6’-8”)
Bridge Railing:	1’-6” to 2’-3” high stone parapet walls topped with single steel pipe railing with steel pipe posts
Superstructure:	The structure is a three-span dry-laid fieldstone arch with varying clear spans (east: 12’-9”±; center: 12’-6”±; west: 12’-4”±) and rise (east: 3’-6”±; center: 3’-7”±; west: 3’-5”±)
Modifications to Original Superstructure:	None
Utilities:	None
Substructure:	Stone masonry abutments, piers and wingwalls
Modifications of Original Substructure:	None
Deterioration of Roadway Surface:	Local cracking and minor settlement in several places; depression in roadway over center arch on north side

DESCRIPTION OF BRIDGE – CONT.

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

Deterioration of Sidewalk / Walkway:	Bituminous concrete deteriorated in several places
Deterioration of Bridge Railings:	Pipe railing and posts bent in several places; south railing held together with duct tape in one place
Deterioration of Superstructure:	Evidence that stones have slipped and/or fallen from superstructure creating gaps and voids in arches. There are cracks in stones in various locations. The original construction of bridge is highly irregular with a wide range of stone sizes and shapes.
Deterioration of Substructure:	There are voids in the stonework for the west abutment and pier. There are also a number of cracked stones

RATING ANALYSIS ASSUMPTIONS AND CRITERIA

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

The inventory capacity of the bridge was rated in accordance with the provisions of the 2002 Edition of the AASHTO *Standard Specifications for Highway Bridges*, the 1994 Edition of the AASHTO *Manual for Condition Evaluation of Bridges with Interims through 2003*, and the 2005 revision of the *Commonwealth of Massachusetts Highway Department Bridge Manual*, Part 1, Chapter 7. The operating stress level rating and the MS18 load factor rating are not required for masonry structures.

The live loads used in establishing these ratings were the standard AASHTO H20, HS20 (actual weight), Type 3, and Type 3S2 truck loadings shown in Figure 7.4.3.1 (page 74) of the 1994 edition AASHTO *Manual for Condition Evaluation of Bridges.*

Statutory levels are 20 tons for H20 trucks, 25 tons for Type 3 trucks, 36 tons for Type 3S2 trucks, and 36 tons for Type HS20 trucks.

The allowable working stress for the stone in this structure was assumed to be 500 psi as sited in the computations. A variety of stone materials were used in the construction of this structure including what appears to be sandstone. The 500 psi value, which is typical for sandstone, was felt to be a conservative representative value to use for the entire structure.

Edwards and Kelcey performed an inspection of the arch barrels for F-09-003 (3KQ) after an initial observation of the bridge and noting concern with the large amount of openings between adjacent stones, and the observed lack of contact between stone elements. For each arch barrel, EK measured the areas of contact for a typical 1-foot wide strip of the arch, which is the standard width of an analyzed strip used in rating a masonry arch bridge. Our measurement and evaluation procedure was comprised of three steps. They were as follows:

- Measure the depth of the joint between two adjacent stones, from underside of each stone (intrados line) to the point where first contact between two adjacent stones within the analyzed strip occurred. The stones that comprise the arch barrels are typically 24 inches deep (intrados to extrados). Based on our measurements, the average distance from the intrados to the first point of contact was 5 inches for the easterly and westerly arch barrels, and 5.5 inches for the center arch barrel. Therefore, reducing the overall effective arch depth to 19 inches and 18.5 inches respectively.

- Measure the total width (out of 12 inches) that the two adjacent stones are in contact. Our measurements indicated that in a typical 12-inch width, only an average of 5 inches, 6 inches, and 8 inches of stone surfaces were actually in contact for the east, west, and center arch barrels respectively. Therefore, the section properties used in determining the stresses on a typical arch were reduced to account for the measured portion of the arch width transferring load via contact between adjacent stones.

- Visually observe and approximate the percentage of contact that occurs within the limits of measured contact area. For example, for the east arch barrel, the average, measured net area of adjacent stones in contact was 19 inches deep by 5 inches wide, but from field observation approximately only 50% of that area is actually in contact due to the irregularities of the interior surfaces of adjacent stones. We estimated that only 50% of the overall measured contact area was actually in contact.

In addition, the overall arch geometry for each span was measured. Particular attention was paid to the north side of the center and west arches, which have a somewhat flatter profile at the crown line. From these measurements, an idealized structural model was developed and analyzed as a two dimensional frame using STAAD-PRO. Hinges were assumed at the springlines.

Edwards and Kelcey found that the arrangement of the masonry is very random, and there are gaps in the construction between many of the adjacent stones. As described above, our analysis does take into consideration a reduction in section properties to reflect the areas of elements that are actually in contact; however, it does not include any compensation for stability. The observed instability of the structure is a significant concern; however, there is no established procedure for incorporating individual voids or irregularities into the arch analysis.

The abutments and piers were not assumed to be critical for rating purposes.

EVALUATION OF RATING AND RECOMMENDATIONS

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

The masonry arch crown location governs the ratings using the allowable stress method, with Inventory ratings of 10.8, 12.3, 19.3, and 19.4 tons for truck types H20, 3, 3S2, and HS20, respectively. The Operating rating and ultimate capacity rating (Load Factor Method) are waived for this bridge because of its masonry arch construction.

There is a great degree of uncertainty of the structural capacity of this bridge. The arch barrels are constructed of randomly sized and irregular shaped stones. This creates significant variations in the actual contact area between adjacent stones in the arch barrels. As a result, there are opportunities for individual stones to slip out of the arch rings, as has been observed in recent inspections. As evidenced by the attached photos, the entire structure has large gaps between most of the adjacent masonry. The typical structural analysis for arches, which we utilized for this rating, is static and has no mechanism for incorporating local voids or missing stones. There is no way, based on the analysis, to predict when an individual stone will become unstable and slip out of the arch ring. We have a significant concern with the local stability of the arch barrel construction.

The bridge, which was originally constructed in 1822, has been functioning effectively for almost 200 years. However, based on a review of the bridge inspection reports for the past 20 years, it appears that the number of voids, or missing stones, has been increasing. We consider this to constitute a major deficiency of the bridge, and recommend the following to maintain the useful life of the bridge structure:

- Develop a repair/maintenance repair plan for filling voids/gaps between the masonry to ensure local stability and load path.
- Investigate the feasibility of a remediation of the bridge with an in-situ structural strengthening system, such as the Archtec© system developed by Cintec.
- Develop a plan to install a crash-worthy railing system.

Edwards and Kelcey recommends that the Bridge Inspection frequency be maintained at three (3) months as noted in the Structure Inventory and Appraisal.

AVAILABLE PLANS

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

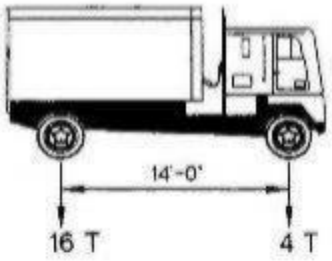
There were no plans available to EK/HNTB for the rating of this structure. The rating is based on field measurements.

TRUCK LOADINGS

FREETOWN **ROUTE 79 (ELM STREET) OVER ASSONET RIVER** **F-09-003 (3KQ)**

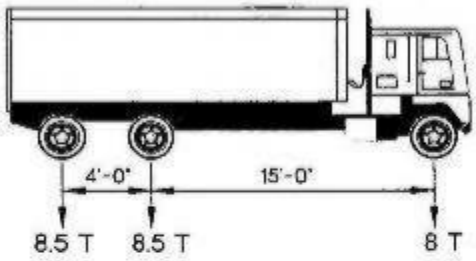
H-20 VEHICLE

TOTAL WEIGHT
20 TONS



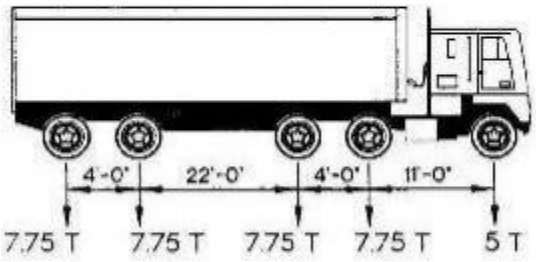
TYPE 3 VEHICLE

TOTAL WEIGHT
25 TONS



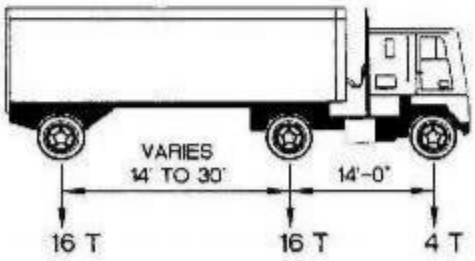
TYPE 3S2 VEHICLE

TOTAL WEIGHT
36 TONS



HS-20 VEHICLE

TOTAL WEIGHT
36 TONS



TRUCK LOADINGS

Massachusetts Bridge Rating

MASSACHUSETTS HIGHWAY DEPARTMENT

HISTORIC BRIDGE INVENTORY

* MASSHIGHWAY HISTORIC BRIDGE INVENTORY *

Town/City: Freetown **MHD Dist.:**
Facility Carried: ST 79, Elm Street
over
Feature Intersected: Assonet River
Structure No: **Photo Nos.:**
BDEPT No.: F-09-003 **B.I.N.:** **AASHTO Rating (date):**

Common/Historic Name (source): East Bridge (Pierce, 1902); Mill Street Bridge (BH)
National Register Eligibility Finding (by/date):

Year Built (source): 1822 (parapet inscription; Freetown MS Town Records, 1822)
Years Rebuilt (source):
Builder (source):
Designer (source):
Structural Type/Material:

Structure Length: **Length of Maximum Span:**
Skew: **Deck Width (out-to-out):**
Main Unit, No. Spans: **Lengths:**
Approaches, No. Spans: **Lengths:**
Plaque: **Location:**
Alterations, unusual features, comments:

Freetown - page 2

Visual Quality (bridge/setting): High ☐ Average ☐ Low ☐ BDEPT No: F-09-003

Site Integrity: Retained ☐ Lessened ☐ Violated ☐

Site Description:

History of Bridge and Site:

This was the site of an eighteenth century dam and grist/saw mill, and there was a bridge at or near this location by 1794, when the road (present-day Mill Street) and crossing appear on the "Plan of Freetown." No information has been found concerning that bridge, but presumably it was a wooden structure. On May 13, 1822, the Town voted "*directing the Selectmen to cause the bridge near the store of Ephraim winslow esq. to be rebuilt with stone & c. at the expence* [sic] *of the town.*" Presumably the present stone arch bridge was built in accordance with this vote. No other references have been found concerning this bridge in either Freetown MS Town Records, 1800-1886 or Freetown Annual Reports (published from 1852).

* The date 1822 is inscribed in the northerly parapet wall.

Sources:

BH: Y

RR: 1979, Louis Berger & Assoc.

Plans: N

OBH: N

Other: L. Bennett, McGinley Hart Assocs., stone arch/slab bridges documentary research project: "Plan of Freetown, 1794." • "Map of Freetown, 1831." • Walling, H.F. "Map of Bristol County, 1851." • Walling, H.F. "Map of Bristol County, 1858." • Beers, F.W. Atlas of Bristol County (1871). • Everts and Richards. Atlas of Bristol County (1895). • Freetown MS Town Records, 1800-1886. • Freetown Annual Reports, 1852-1905. • Hurd, D.H. History of Bristol County (1883). • Rogers, Earl II and Mark Andrew Ashton. Freetown, A Tricentennial Sampler (1983). • Rogers, Earl William II. A Lexicon History of Freetown, Massachusetts (1973). Pierce, Palo Alto, ed. History of Freetown (1902). • Massachusetts Historical Commission Reconnaissance Survey Report: Freetown (1981). • MHC Cultural Resources Inventory Form #FRE.900. • National Register of Historic Places Registration Form: Assonet Historic District, 1999.

Summary Statement of Significance:

Statement Prepared By: **Date:**

Field Survey By: **Date:**

This Historic District was placed on the National Register of Historic Places on Sept 9, 1999